Homework 1 – CS 252: Section 2

Due: January 27th, 2016, by the beginning of class

Instructions: Complete your work on this homework alone. Studying topics in groups is encouraged, however, your work on your homework must be your own. Please write legibly, and include your name and netID. All pages must be printed and stapled.

Name (Last, First): ___________________
Net ID: ___________________

Problem 1 (4 points)

a) Do we have a final for this course?

b) How many exams do we have in this course? Are they cumulative?

c) How many homeworks do you have for the course? Are any dropped?

Problem 2 (3 points)

This question has no wrong answer, it is here so I can get to know you better.

a) What is your major?

b) What other Computer Science courses have you taken in the past?

c) What do you hope to learn from this course? Just getting credit is fine, but list if there is a particular topic of more interest to you.
Problem 3 (6 points)

Assume you have multiple “black boxes” that take two inputs and perform a simple operation on them, then output the single number. You have black boxes that can perform addition (+) and black boxes that can perform multiplication (*).

We want to connect these together to do slightly more complex computation. For example, if we wanted to do \((a+b)*c\), we could connect the boxes like this:

![Diagram of connected black boxes](image)

a) Draw and connect the boxes to perform the following:

\(4a*b\)

\(b^3+c+d\)
b) What are the minimum number of boxes that you would need to compute \( b^6 \)?

**Problem 4 (2 Points)**

Give an example of an abstraction and how it can be broken down into more detailed parts.

**Problem 5 (4 Points)**

What are the seven levels of abstraction for a computer?

Ignoring any level of abstraction could take away some ability to make best use of the computer. What difficulties arise if, for example, we do not have the language level?
Problem 6 (3 Points)

For each of the descriptions below, give the name for the level of abstraction or transformation that is being described.

a) Describes the basic operations that the target computer can execute. Normally composed of operands of a certain data type.

b) Takes a program written in a certain language and breaks it down to the basic instructions that the particular target computer can execute.

c) Involves the implementation of basic logic circuits, such as circuits for addition, multiplication, etc.

Problem 7 (2 Points)

What is the definition of Moore’s Law?